

## RETURN

(No. 20 i)

To an ORDER of the HOUSE OF COMMONS, dated 28th February, 1878;—For copies of all Reports of Engineers, Memorials, &c., relating to the Survey and location of the line of the Pacific Railway between the Red River and Battleford, and not heretofore laid before Parliament; and also all Reports, &c., relating to the proposed line of said Railway between the same points, but south of Lake Manitoba.

By Command.

R. W. SCOTT,

*Secretary of State.*

DEPARTMENT OF THE SECRETARY OF STATE,

OTTAWA, 25th April, 1878.

WINNEPEG, 21st October, 1874.

DEAR SIR,—I returned on Sunday after making the inspection of Lakes Manitoba and Winnipegosis, and the river Saskatchewan from its mouth up to Muddy Lake, in accordance with your instructions to me before leaving Ottawa. I was prevented leaving earlier in the season, by the difficulty of procuring transport and matters which required attention here.

I left here on the 3rd September and returned on the 18th instant, having been absent six weeks and two days; out of this time I was detained in camp, by storms of wind, sixteen days, but in other respects the weather was delightful. The first perceptible frost was on the night of the 15th September, when I was encamped on the upper portion of the Waterhen River. On the night of the 10th October we had ice one-quarter of an inch thick on the pails and it froze on the oars in the sunshine until 10 a.m. next day, but with this exception I have hardly required an overcoat the whole time. The prevailing winds at this time of year appear to be north-west and south east, it blows with great regularity on alternate days from one of these quarters. When from the former, the barometer always falls, and, when from the latter it rises. Storms rise with great suddenness, and in half an hour after they begin to blow there is a very heavy sea running.

The total distance travelled must have been over 800 miles.

From here I went to Oak Point, Lake Manitoba, by wagon, thence to the Narrows in canoe, from there to Mossy Portage in a Hudson Bay Company's boat, and from there down and up the Saskatchewan and back to Swampy Creek, Lake Winnipegosis in canoe, thence back to Oak Point in Hudson Bay Company's boat, the weather being too stormy to venture in a canoe.

I now have to report as follows, dividing the subject into two heads, viz :—

1st. The country and timber ;

2nd. The waters traversed.

From here to Oak Point, a distance of about 65 miles, the road I travelled runs almost in a direct line (north-west) passing close to the south and west sides of Shoal Lake. For the first twenty miles of the above distance, the country is, for the most part, open prairie and the land good; from that point it becomes gradually poorer, being covered in some places by clumps and belts of poplar, of small size. When the neighbourhood of Shoal Lake is reached the land is very poor, being covered in many places by white saline incrustation and a great many boulders of moderate size; the subsoil being a yellowish clay and gravel. This may be said to continue all the way to Oak Point, and probably further north; there are, however, some extensive tracts of excellent hay lands in the neighbourhood of Oak Point. As this name implies, there is a good deal of oak timber in the vicinity, but I did not see any exceeding six inches in diameter and twenty feet high, in fact it looked stunted.

At this time of year, or during a very dry season, there are only two points, at present, where good water can be obtained between this place and Oak Point; namely, at "Boyd's Cattle Farm," where there is a well of excellent water, with a pump, and at a small fresh water lake on the south-west side of Shoal Lake; the water of the latter is very brackish, it is not deep, and is said to have no outlet.

From Oak Point to Swan Creek, a distance of about fifteen miles, along the north shore of Lake Manitoba the country appears to be of the same character, with an extensive belt of reeds and rushes along the shore, extending a considerable distance into the lake. Little or no timber can be seen.

From this point to the Narrows the country seems to improve, although in some places low and swampy; it is covered by a thick growth of timber, principally poplar of good size.

About the Narrows and the numerous islands in the neighbourhood, there are extensive beds of reeds and rushes, and at its upper end limestone rock *in situ* appears for the first time.

I believe there will be no serious difficulty in the way of carrying the Railway, in a direct line from the Narrows to the crossing of the Great Bog, except at two points, Dog Lake near the Narrows and Shoal Lake near this end.

From the Narrows to the crossing of Mossy River the country is generally dry; there is, however, some swamps in the neighbourhood of Ebb and Flow Lake; it is well timbered with poplar, some spruce and a few tamarac; there are excellent grass lands on the west side of Lake Manitoba.

From the Narrows to Waterhen River, at the head of the lake, the shores, as seen from the water, are higher than on the lower portion, and appear throughout to be well timbered.

There is a considerable quantity of spruce, of fair quality and good size, to be found on the lower half of the Waterhen River. On the upper portion of the river from Lake Winnipegosis to Waterhen Lake, and at its mouth in Lake Manitoba, there is a vast area of reeds and rushes.

The country around Lake Winnipegosis is all thickly wooded with poplar, tamarac, elm and oak. The soil seems to be of fair quality, but lighter and more sandy than the prairies. Limestone rock *in situ* is found at various points round the shores of the Lake.

In the neighbourhood of Mossy River the land is good, and limestone rock is visible at the point where, I think, the Railway will cross. When proceeding westward along the line of Railway (as explored) from Mossy River, a portion of the country, in the vicinity of the south-west side of Lake Winnipegosis, is swampy, but not to such an extent as to create any serious difficulty in constructing the line. As you approach and pass round the north-eastern end of the Duck Mountains, the land improves and there is very fine timber. In the valley of the Swan River there is some magnificent land, unsurpassed by any in the Province.

Pieces of lignite of first class quality have been found in it and some of its

tributaries this summer, by members of the Geological Staff; but they did not succeed in finding the place from which they had been carried by the stream. I am informed that the country in the neighbourhood of Dauphin Lake is very fine.

I visited the place on Redden Point, Lake Winnipegosis, marked "salt works" on the map. It is a most desolate looking spot, there being no vegetation in the neighbourhood of the place where the salt is produced. The neck of land is quite level and but little above the level of the lake. The brine issues with considerable force from some natural holes in the ground like a spring; but, I am informed, that by digging wells in its vicinity brine of greater strength is procured.

The method employed to make the salt is very crude, and the extent to which it is manufactured small; there are a few wrought iron pans of a rectangular form, about four feet long, two feet six inches wide and fifteen inches deep; in these the brine is placed, and a fire being lighted beneath the water is evaporated and the salt remains. As the brine is not kept in motion while being evaporated, the crystals of salt are very coarse, and being evaporated to dryness the salt is not very pure although of a good colour. When made it is packed in baskets of birch bark and sent to Winnipeg. It is now owned and occasionally worked by the Hon. J. McKay, when the prices of salt is high. There is no doubt, however, that when the demand for salt is greater, and as the country gets more settled, the railway passing in the neighborhood, that a good business can be done in it.

The southern end of the Mossy Portage and the country around is heavily timbered with poplar, spruce, tamarac and balsam, of a very good size; for half a mile at the north end the ground is low and swampy, and the cedar, which is seen on the shores of Cedar Lake, is very small. All the south-east and east shore has been completely swept by fire, some time ago, and, as seen from the water, has the appearance of a prairie. The ridge of land which divides Cedar from Winnipegosis Lake continues almost at a dead level all the way to the Grand Rapids of the Saskatchewan.

The country on both sides of this river from Cedar Lake down to its mouth, seems of indifferent quality. Limestone rock is visible at many points, but there are some tracks of good land; it is all thickly wooded. From Cedar Lake upwards, as far as I went (to Muddy Lake), limestone rock is visible at several points in the south bank; at these places the banks are from 6 to 10 feet above the water and covered with poplar, spruce, &c.; the intervening spaces are extensive swamps. The northern side seems low and swampy and the river is divided into numerous channels by large islands of reeds and rushes.

## *2nd. The Waters Traversed.*

There is very considerable inaccuracy in the general form and position of Winnipegosis and Cedar Lakes; and the Saskatchewan River, from Cross Lake to its mouth, is not nearly so straight as is shown on the maps.

I herewith enclose a sketch map which I have made from notes taken on my trip, which, although not professing to be perfectly accurate, is more like them.

The map of Manitoba Lake, which we purchased of Mr. Waggener last spring, seems generally accurate, although many details of the shore line are wanting, and there are a great number of islands in the lake which are entirely omitted.

Manitoba Lake is generally very shallow, especially that portion of it south of the Narrows. I believe the greatest depth found is about twenty feet, and to obtain four or five feet of water, a considerable distance from the shore must be traversed along all the coast that I have visited.

The northern portion is rather better in this respect, but both in it and the southern there are a great number of reefs of boulders; some parts of these are a few feet above water, others just awash, while others again are a short distance below the surface. A careful survey of the lake would therefore be necessary before it could be safely navigated.

The waters of the lake are subject to considerable fluctuations apart from high or low water; a northern wind will raise the water at the south end one to two feet,

and *vice versa*. There is at such times a very strong current either up or down through "The Narrows."

The Hudson Bay Company's Office, at Manitoba House, informed me that during the time a strong west wind was blowing, the water receded 100 feet from the end of their wharf, where, at ordinary times there is about eighteen inches of water, leaving the bottom dry to that extent.

In the vicinity of "Meadow Portage" the water of the lake is shallow for a considerable distance out from the shore, and this remark applies to even a greater extent to the water of Winnipegosis, at the other end of the portage; so that the construction of locks and a canal in that neighbourhood would be a costly undertaking.

The upper portion of the Waterhen River could be rendered navigable for steamers of the class which navigate Red River or the Saskatchewan, at a moderate expense; but where it flows out, Waterhen Lake, the work would be much more costly. From there down to Lake Manitoba in which portion of the river most of the fall occurs, I do not think could be rendered navigable by the removal of boulders and stones in the existing rapids, as this would only have a tendency to lower the water at other parts. To attempt to render it navigable by dams, locks, &c., would, if practicable, which I much doubt, be a costly undertaking.

The direction of the wind has a great effect on the level of water in the river.

Lake Winnipegosis is considerably deeper than Manitoba; still there are some places where it is shallow for a considerable distance from the shore. This is the case at Mossy Portage. At the southern end, where Mossy River emptys into it, and in that river as far up as the Railway crossing, there is plenty of water.

The remarks which I made in reference to reefs of boulders in Lake Manitoba applies also to this lake; but they are not so numerous. I have already remarked about the storms.

Before passing to the waters of the Saskatchewan, I will report on the possibility of forming a connection between them and Lake Winnipegosis.

Up to the present time it was supposed that the Mossy Portage would prove the best place for the purpose; but, in addition to the disadvantage of the shoal water at its southern end, the amount of excavation would form a most serious item. As you are already in possession of the details in reference to it, I shall only add that I think it very probable rock would be found, in making the excavation, before the requisite depth was reached. In addition to this, both ends of the portage are very much exposed, the southern end to gales from E.S.E. round to S.W., and the northern from N.W. by N. round to N.E.

I found two other points, either of which, I believe, prove better locations for the proposed canal; they are marked respectively A and B on the accompanying sketch map, and are being surveyed by W. Bender.

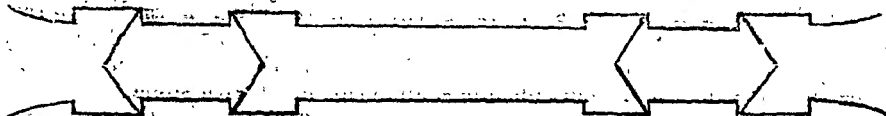
At the line marked A the water is deeper at both ends; then, at Mossy Portage, the height of land to be crossed is some 40 feet less lower, and the length of the cutting will probably prove a mile less; it is much better sheltered at the southern end.

At the line marked B advantage could be taken of a portion of "Swampy Creek," which is about 60 feet wide, and has a depth of water ranging from 7 to 9 feet for a distance of from two to three miles from its mouth, and has little or no current.

This line would be longer than at A, from water to water, but it is believed that the whole intervening space is wet swamps, which might be excavated by means of a steam dredge; and, as its northern end would be in the Saskatchewan River, the storms in Cedar Lake would be avoided, and the line westward would be more direct than in the other case. It is, however, impossible to express a satisfactory opinion on the respective merits of the two routes until the surveys are made.

It has been assumed, up to the present time, that the levels of Winnipegosis and Cedar Lakes are the same. Now, although this may be the case at certain stages of the water in each, yet as the Saskatchewan is subject to considerable fluctuations in level (from three to six feet), between high and low water, and Winnipegosis is also sub

ject to considerable fluctuation, although not to so great an extent, and arising from different causes, it may so happen that at times the water in Cedar Lake will be higher than in Winnipegosis, and at others that the difference in level will be reversed. This may possibly necessitate the construction of a lock with double gates, which, when the waters are level, could be kept open.



The outlet of Cedar Lake is a short distance north of the point marked C, on the accompanying map. Here the river may be said to commence, and from this point down to its mouth there is no point on the river where the current in the centre flows at a less velocity than from three to four miles an hour.

Leaving the Grand Rapid out of the question altogether, there are six places, three of them heavy rapids, where the current must range from six to nine miles an hour. At two points the steamboat cannot get up without the aid of a strong cable, made fast on shore, which is wound up by steam power on the boat, while, at the same time, her wheel is kept going at full speed. These points are in the Red Rock and Cross Lake Rapids.

I do not think the Company would attempt to run their steamboat on the portion of the river under consideration, were it not for the great cost of transport (by teams) between the points referred to.

It is, of course, true that the thing may be worked, as at present, for some time to come; but as a permanency it would never answer. With this object in view a road or tramway could be built from the steamboat landing below the Grand Rapids to the steamboat landing above, at a moderate expense, as there are no engineering difficulties in the way. But to make the Lake Winnipeg and Saskatchewan now a good route, either a canal or a railway would have to be built round the whole of that part of the river under consideration. The former would cost a great amount of money; the latter would not, I believe, entail great expense.

For the Railway, the south side of the river would prove the best, as I am informed that there is a comparatively level ridge extending the whole distance; while on the north side the country is much broken up, and the northern end of Cross Lake extends much farther north than is shown on existing maps. The probable length of the line on the route proposed, would be between 15 and 20 miles.

I might here mention that I think the fall between Cedar and Winnipeg Lakes has been under-estimated, and probably from five to ten feet.

If, however, the connection between Lake Winnipegosis and Saskatchewan can be made at anything like a reasonable expense, it appears to me that will be the best route to follow, for several reasons, among which are the following:—

The mouth of the Saskatchewan is blocked by ice in spring to such an extent that its upper portion and Lakes Winnipegosis and Manitoba open from a fortnight to a month before it.

The Railway passing a navigable point at the southern end of Winnipegosis, goods would only require one transshipment.

The water portion of the route on this line would be much better sheltered than on the other. The cost of constructing the piece of Railway between the mouth of the Saskatchewan and Cedar Lake would go some way towards making the line to Winnipegosis.

I remain, dear Sir,  
Yours truly,

JAMES H. ROWAN.

SANDFORD FLEMING, Esq.  
Engineer-in-Chief,  
Canadian Pacific Railway.

WINNEPEG, 27th March, 1875.

DEAR SIR,—I send in Mr. Rheault's charge, the plans and profiles of the line from Shoal Lake to Mossy River.

It is difficult at this season of the year to estimate the necessary openings for culverts, and we were able to find only a few water courses, except the large streams. I would say that the Narrows at Shoal Lake will require only a beam bridge from 10 to 20 feet opening—from that point to the Narrows. Lake Manitoba beam culverts from 6 to 10 would be suitable, except Dog Lake, where it would be well to bridge the two crossings with short openings, and cribs filled with stone.

There is spruce round the shores of the lake and plenty stone for the purpose.

The result of the borings made at the Narrows of Lake Manitoba is shown on the profile. Rock is found only on the east shore, and it dips rapidly to the west.

From the specimen of the clay brought in and the resistance offered in boring, I should say that timber platforms and concrete would be sufficient for the foundations, and that piles would not be required. The culverts from the Narrows of Lake Manitoba to Mossy River should be generally beams, from 6 to 10 feet, except at the following places. The central opening of the bay, west of the Narrows, should be bridges same as Dog Lake, the other openings should be embanked with protection on the sides of rip-rap or crib work.

Crane River, Muskeg, should have an opening from ten to twenty feet wide. The creek at Station 402, East of Mossy River, should have an opening fifty feet wide to admit back water from Lake Winnipegosis, and for the same reason the creek at Station 338-30 feet wide. For stream at 148, the opening should be twenty feet. The creek at Station 24 should have an opening thirty feet wide, and Mossy River, I should say, ought to have three openings of sixty feet each.

The line generally follows the watershed between Shoal Lake and Lake Manitoba, and that between Lake Manitoba and Ebb and Flow Lake, so that there is not much cross drainage till near Lake Winnipegosis.

The line located throughout is well suited for railway construction. Wherever the bottom appeared to be soft it was examined and generally found to be solid from three to five feet below the surface. The soundings taken are shown on the profile.

Rock is found at the Narrows of Lake Manitoba, also in the ridges south of Lake Winnipegosis, and at Mossy River.

Gravel will probably be found along the sides of those ridges.

The subsoil generally is a mixture of gravel and clay.

The timber is almost entirely poplar of a fine quality, and will make good fuel for engines. Along the shores of the lakes there is a growth of small oak and some fair spruce.

The snow-fall, this winter, did not exceed two feet, but the cold was very great. In the months of January and February the thermometer seldom ranged higher than 20° below zero, generally down to 30°, sometimes to 40°, and once 43°.

I am yours truly,

(Signed)

HENRY F. MACLEOD.

JAMES H. ROWAN, Esq.,

